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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,262	09/07/2004	Soichiro Okubo	39.003-C	5261
29453	7590	09/08/2005	EXAMINER	
JUDGE PATENT FIRM RIVIERE SHUKUGAWA 3RD FL. 3-1 WAKAMATSU-CHO NISHINOMIYA-SHI, HYOGO, 662-0035 JAPAN			JUBA JR, JOHN	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/711,262

Applicant(s)

OKUBO ET AL.

Examiner

John Juba, Jr.

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 11, 12, 22-26, and 27/11, 27/12, 27/22, 27/23, 27/24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 11, 12, 22-24, and 27/23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 25, 26, 27/11, 27/12, 27/22, and 27/24 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Priority*

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10/065,738, filed on November 14, 2002.

### *Specification*

The abstract of the disclosure is objected to because it is not directed to the invention as now claimed. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 25, 26, 27/11, 27/12, 27/22, and 27/24 are rejected under 35 U.S.C. 102(b) as being anticipated by Semiconductor Energy Lab Co (JP 05-273425 A; hereinafter "Inoue, et al"). Referring *for example* to the discussion of Figure 3B in the machine translation (*esp. para. [0035]*), Inoue, et al disclose a DLC film (layer atop cladding layer 20). characterized by having refractive indices (of core composition 22, and cladding compositions 21 and 23) distributed in a pattern oriented within the plane of the film.

Art Unit: 2872

believes that such inclination fairly constitutes a "bias with respect to the thickness of the film", as recited.

With regard to claims 27/11, 27/12, and 27/22, the recitation of the method by which the refractive index distribution is imparted has been considered for all it conveys about the claimed *structure*. For example, the film of Inoue, et al is a hydrogen-containing DLC film, having a distribution of  $sp^3$  bonds that varies in the direction across the plane of the film. In this respect, the prior art DLC film appears to be the same as the recited DLC in every structural aspect. "Process limitations cannot impart patentability to product claim where product is not patentably distinguished over prior art." *In re Dike*, 157 USPQ 581 (CCPA 1968). It is well-settled that the "[p]resence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product." *In re Stephens*, 345 F.2d 1020 (CCPA 1965), 145 USPQ 565, citing *Dilnot*.

With regard to claims 26 and 27/24, Inoue, et al disclose that the refractive index pattern can be inclined with respect to the plane of the film (para. [0036]). The examiner believes that such inclination fairly constitutes a "bias with respect to the thickness of the film", and a refractive index structure "sloping with respect to the film's thickness", as variously recited.

### ***Allowable Subject Matter***

Claims 11, 12, 22 – 24, and 27/23 are allowed. The following is a statement of reasons for the indication of allowable subject matter:

The prior art taken alone or in combination, fails to teach or fairly suggest a method of transforming a DLC film, comprising the step of irradiating at least one region of the film with either a particle beam or an energy beam to raise the refractive index of that region, whereby a distribute refractive index structure is created with the DLC film, as recited in claim 11.

Similarly, the prior art taken alone or in combination, fails to teach or fairly suggest a DLC film characterized by having a distributed refractive index pattern created by a film-transforming method carried out on a DLC film having a refractive index smaller than 1.6 and an extinction coefficient smaller than  $1 \times 10^{-3}$  with respect to light within a wavelength range of 550 nm to 650 nm as recited in claim 27/23.

Ken-ichi Kawamura (cited below) disclose a method of exposing single crystal diamond to an energy beam to modulate the refractive index, and suggest the method for other dielectrics, including SiC. Kawamura, et al employ a single interfering pulse pair, and do not disclose any further variation in refractive index as arising from either increased pulse energy or an increased number of pulses. Since there is nothing to suggest that any change in the irradiation of the DLC films already formed by the interference of a single pulse pair would give rise to any further variation in refractive index, there is nothing in their disclosure that would suggest irradiating a DLC film with either a particle beam or energy beam to raise the refractive index of the exposed region.

### ***Conclusion***

As a matter of course, all of the references cited during prosecution of parent application serial number 10/065,738 have again been fully considered. However, unless a reference is cited on examiner's form PTO-892, applicants' form PTO-1449, or equivalent, the reference will not appear on the face of any patent issuing from the instant application.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gupta, et al (U.S. Patent Appl. Pub. no. 2003/0086056 A1) disclose diamond like carbon as a material suitable for in-plane index modulation defining an optical element (see Table 1).

Philips (U.S. Patent number 6,545,809) discloses DLC films with a relatively high refractive index in the visible region.

Babich, et al (U.S. Patent number 6,428,894) disclose a method of changing the refractive index of DLC films by manipulating the deposition process parameters.

D.P. Dowling, et al (*Diamond and Related Materials*) teach that the refractive index of DLC films can be changed by manipulating the deposition parameters.

Ken-ichi Kawamura (*Jpn. J. Appl. Phys.*) disclose a method of exposing diamond to an energy beam to modulate the refractive index, and suggest the method for other dielectrics, including SiC.

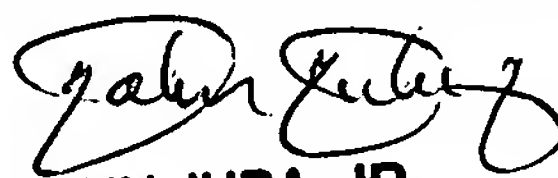
Although not prior art with respect to the instant disclosure, Shiozaki, et al (U.S. Patent Appl. Pub. no. 2005/0152037A1) discloses a diffraction grating assembled from layers wherein at least one layer is a DLC film of which refractive index changes by irradiation of an energy beam. This claim of this application has been considered as to double-patenting.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 - 5.

The **new centralized fax phone number** for the organization where this application or proceeding is assigned is (571) 273-8300 for *all* communications.

  
**JOHN JUBA, JR.**  
**PRIMARY EXAMINER**  
**Art Unit 2872**

September 6, 2005